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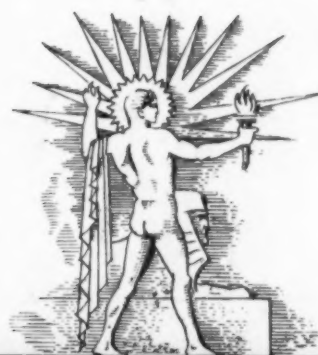
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SEP 19 1938

# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE.



September 17, 1938

Gathered to Its Ancestors

See Page 190

A SCIENCE SERVICE PUBLICATION

## Do You Know?

Romans made cement by mixing volcanic ash with lime.

In 1895 the total number of automobiles registered in the United States was four.

Fresh vegetables retain their vitamins and their sugar better if kept in a cold place.

The Soviet Union's 12,000,000-volume library in Moscow is called the world's largest.

Radio sets are now being especially made for use in hot and rainy countries of the tropics.

More than half the desert lands of Arizona are covered with creosote bush and salt bush.

When the Pilgrims landed in America they found Indians using crude oil as a medicine.

Shooting deer with bow and arrow will be permitted in southern Wisconsin for one month this fall.

Lick Observatory in California is credited, among its achievements, with discovery of 4,000 visible double stars and 36 comets.

Mica has long seemed to be a mineral without a substitute, but now something just as good can apparently be made cheaply by centrifuging bentonite.

## QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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How many amino acids are necessary for life? p. 185.

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How do convicts react to ink blots? p. 184.  
How many 90-year-olds go to movies? p. 191.

### SURGERY

What can surgeons do for hideousness? p. 185.

A number of rivers that reach London become lost, being hidden in tunnels or carried along far underground.

Coins for small change in Italy are to be made of a new alloy called acmonital, presumably containing very little nickel.

A British bird fancier who advises against giving cake and other sweets to cage birds points out: "You don't give your children birdseed for a treat."

Feather-leaved nipa palms of the Eastern tropics grow in swamp lands which, according to Dr. B. E. Dahlgren of Field Museum, probably constitute the world's largest potential source of cheap alcohol.

An American physician, returned from visiting European hospitals, finds that local anesthesia is preferred to the general anesthesia produced by inhaling ether or other gases in these countries except England.

## SCIENCE NEWS LETTER

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## ARCHAEOLOGY

# Archaeology For the Future Now Being Sealed in Crypts

Representative "Samples" of the Twentieth Century  
Expected to be Dug up Thousands of Years Hence

**C**HEER UP! If our civilization is wiped out after a while, all will not be lost.

Any number of efforts are being put forth to make sure the future knows all about us. For instance—

A "Time Capsule" with more surprises than a Christmas stocking for its future discoverers is being prepared by the Westinghouse Electric and Manufacturing Company for burial on the site of the New York World's Fair of 1939.

## Records and Gum

In Atlanta, Ga., Oglethorpe University is working hard to pack a crypt of civilization. It is to be a veritable museum of our times, for future explorers to open. It will contain an assortment of goods ranging from phonograph records to chewing gum, and, of course, books and documents and sound records to explain who we were and the interesting things we did.

Another sort of record making is in progress out in the South Dakota hills, where Gutzon Borglum is carving his giant portraits of Washington, Jefferson, Lincoln and Theodore Roosevelt on Mount Rushmore. If future heirs of America can't make anything of our millions of books and our gadgets and funny writing, they will be impressed anyhow by these great stone faces.

Most people feel awestruck looking at heroic statues of Egyptian pharaohs, but they are pigmies compared to Borglum's American heroes. A stone worker drilling at the head of Theodore Roosevelt—now being carved—is a mere fly on the nose of the stone face.

Westinghouse's "Time Capsule" is a copper alloy tube seven feet two inches in length and eight inches in diameter. Buried 50 feet underground, it is supposed to lie there untouched until our busy civilization has worn itself out and the scientifically eager people 5,000 years from now come across the directions for finding this buried story of us. It will contain records, many of them on microfilm, showing our culture.

To make sure they don't miss this nice problem in scientific detection, the

"Time Capsule's" buriers are working out a book durably printed and bound telling where it may be found. The book will contain a language key, something like the Rosetta Stone, in case the discoverers don't know plain English. Given the same piece of writing in an assortment of languages, future scholars ought to find one inscription they can read. We hope we won't be deadlier than that.

The book is to be turned out in an edition of several thousand copies and is to be deposited in libraries, museums and repositories. Even with wars, earthquakes and other calamities, one copy ought to escape destruction.

With an inner glass crypt, which will be about six inches in diameter and will be filled with an inert gas to aid in preserving for 5,000 years the objects placed in the capsule, the tube is made of a corrosion-proof copper alloy recently developed. Made of several sections, its outside is to be brazed so that it will present a solid, unbroken surface of metal. The last section is to be shrunk-fit on tapering threads and will be placed on after the inner crypt has been filled. It will be watertight even without brazing—brazing after the contents have been placed in the tube has been ruled out for fear the contents might be damaged.

## What Would You Put In?

If you were filling such a capsule, whose crypt will be more than six feet long, what would you choose to show unknown future Americans what the world was like when you were alive? Now, there's a good parlor game.

Actually, it isn't easy to cram a cross-section of civilization into limited space. David S. Youngholm, chairman of his company's World Fair committee, has asked the advice of scientists, historians and others on what should go inside the "Time Capsule."

"It is hoped that the selection of the contents will be such as to give a true cross-section of our times," Mr. Youngholm explained. "Much of the material so far suggested consists of books and other printed matter. These, reduced to microfilm, will still leave space for a



DOOR TO THE FUTURE

*Entrance to Oglethorpe University's Crypt of Civilization, in which archaeologists of the year 8113 will find a complete record of civilization today. A sign on the door warns people to keep out until the appointed date.*

considerable number of material objects of our time, provided they are small, and provided they are truly significant."

Some of the proposed items have included the following:

The Bible and World Almanac in tiny form on microfilm.

Newsreels showing our sports, political events and bathing beauty shows.

Important scientific formulae that might be lost.

Tiny models of airplane, telephone, ocean liner and radio.

Front pages of newspapers on microfilm.

A record of Caruso's voice.

Motion pictures of our industrial life.

What the bright minds of five thousand years hence can make of our civilization from such exhibits is a question. If they can evaluate our finance, art and politics they will, perhaps, be doing better than we ourselves.

Archivist T. K. Peters, of Oglethorpe University, is preparing for their crypt thousands of pictures and writings, reduced in size and reproduced on metal





#### TOTEM HONORS FOR THE PRESIDENT

Maybe it doesn't exactly resemble the Great White Father in Washington, but Charlie Edwards, 83, patriarchal totem carver for the Swinomish Indians, says it is a likeness of President Roosevelt, and so it must be. The bust will appear near the top of a 61-foot totem pole to be erected on a recreation field developed by WPA workers on the Swinomish Indian Reservation at La Conner, Washington.

and cellulose acetate film. Photographs alone cover 100 years of our wars, our efforts to explore the earth and other doings that look important to us. The film is protected by putting it into glass tubes in an atmosphere of helium and a judicious amount of moisture, and the tubes are sealed.

The document storing is being done for the benefit of the people alive in Georgia in 8113 A. D. A warning sign on the crypt will forbid opening it sooner.

"Why 8113?" everybody wants to know.

Dr. Thornwell Jacobs, president of Oglethorpe, chose that date because, when he started the project in 1936, 8113 was just as far in the future as the total number of years man has recorded events in the past. Check the arithmetic if you like. He figures from the date Egypt's calendar presumably started, and that is 4241 B. C.

To be sure, we are not the first people to take concern for the permanent recording of our achievements. Ancient rulers had the same idea when they ordered their conquests chiseled on enduring stuff.

When Persian King Darius laid the cornerstone of his palace in Persepolis, 2,450 years ago, the cornerstone box was made of limestone and in it were solid

gold and silver plaques suitably inscribed. Soviet scientists seem to be taking a leaf from King Darius' notebook, by putting valued records reduced in size on thin platinum, enclosed between glass slabs and boxed in basalt.

*Science News Letter, September 17, 1938*

#### ENGINEERING

### Buildings Shaken To Fix Their Vibration Period

**N**O matter how sturdy they may seem, buildings, like people, have a pulse. Of course the pulse can not be the ebbing and flowing of a blood stream, as in man, but buildings do have characteristic, pulsating vibrations that sometimes need engineering analysis and correction.

Many things in, or around, a building may cause annoying, tiny vibrations. Sometimes unbalanced machinery in the structure will cause the trouble. Or it may be wind gusts, nearby subway or street traffic or even the elevators.

In one Atlantic City, N. J., hotel annoying vibrations were analyzed and finally traced to the machinery of a power plant in the vicinity.

Vibrations of the plant's equipment, transmitted through the wet sandy soil, were synchronous with one of the dominant periods of vibration of the hotel structure. In this condition of vibration

resonance the annoying oscillations, while very small, were passed on to the hotel's guests.

Engineers study building pulses with shaking machines which rotate and, because they are intentionally put out of balance, transmit vibration directly to the rigid members of a building's frame. As the frequency and size of the intentional vibrations are changed, engineers can find certain ones to which the building responds as a whole.

*Science News Letter, September 17, 1938*

#### ECONOMICS

### World is House of Plenty; Nationalism Erects Bars

**I**F THE world were a single economic unit, without national barriers and with problems of distribution solved, it would be able to answer all possible demands upon it for raw material.

Food materials are likely to be adequate for a world population at least three or four times that of today. Although the future of some of the base metals is obscure, the world as a whole need fear no shortage for an indefinite period of raw materials for clothing, shelter, heat, power and the principal necessities and luxuries of life. For the few natural resources that are definitely exhaustible, nature has made abundant provision of possible substitutes.

Data compiled by Dr. Frank E. Lathe, of the Canadian National Research Council, show that for a world of competing nations the prospect is very different indeed. Complete economic self-sufficiency is impossible. Even the self-sufficiency for which many great powers today are striving can be attained only by a major sacrifice of the standards of living.

Take the matter of major minerals: Coal, iron, copper, lead, zinc, nickel, tin, asbestos, petroleum. Only the United States and the British Empire are in a happy position. Dr. Lathe finds the British Empire deficient in petroleum and the U. S. A. lacking in nickel, tin and asbestos. Canada and the United States taken together lack only tin, for large supplies of nickel and asbestos are just over the northern border of eastern United States.

In contrast, three militaristically rampant nations have notable national insufficiencies. Germany is self-sufficient only in coal and lead, and partially sufficient in iron and zinc. Italy is partially sufficient only in coal, copper and zinc. They lack all the other major minerals.

*Science News Letter, September 17, 1938*

GENERAL SCIENCE

# Activity of "Radicals" Marks British Scientific Circles

## Many Younger Scientists Outspoken in War Opposition, And Determined to Make Influence Felt in Government

By WATSON DAVIS

**A**MONG the most surprising phenomena of British science today (to an American) is the prevalence of constructive liberal sentiment and organization.

Articulate and aggressive are the protests against the use of science in war preparations, against "the frustration of science" which enriches industry while people are undernourished, and against infringement of intellectual liberty.

### Well Advertised

During the recent British Association for the Advancement of Science meeting, there was such a wealth of what in America would be called "radical" meetings, that interested scientists had their evenings filled, often being forced to choose between sessions with similar objectives. These were not hidden, underground gatherings of borderline scientists. Handbills and posters plentifully distributed throughout Cambridge's historic buildings and streets gave notice of these sessions. The combinations (club rooms) and other rooms of famous Trinity and St. John's Colleges were used as meeting places. And the organizers and speakers included those who write F. R. S. (Fellow of the Royal Society) after their names, officers of the B. A. A. S., world authorities in their scientific fields.

Ominously concerned are these scientists over the possible imminence of war—war that will bring high explosive bombs and poison gas raining upon London, Cambridge, Oxford and other British centers of world culture. They also see the possibility of making the world a better place in which to live, if the holocaust of war can be avoided.

Among them now live brothers in science exiled from Nazi Germany for intellectual heresy. They are determined that it shall not happen in England.

The Cambridge Scientists Anti-War Group packed the Trinity College Combination for an evening meeting. They are not merely "agin" war. On the out-

skirts of Cambridge they have built test structures according to the government's instructions for A. R. P. (Aerial Raid Precautions)—and they have shown in what ways these are defective. They have pointed out that whereas most of the widely advertised A. R. P. are against gas, it is high explosives dropped from the air that do the damage in Spain and China.

The sentiment of Cambridge scientists, including economists, toward war was probed by questionnaires, which one out of five answered. Of these, 20 per cent. proved to be P-Ps, positive pacifists, who would eschew war at any cost, and about the same number were for strong armaments as a war prevention measure. The others believed in the League of Nations, Popular Front Socialism or economic measures.

Both those who had seen the World War and those who had not, spoke at this peace meeting. Prof. F. J. M. Stratton, of Cambridge University, for instance, describing war as "bloody, futile, stupid and ghastly," said that he would again take up arms for defense of Britain if necessity demanded.

### "Like Old Tin Cans"

Minorities in dictator nations are being thrown over frontiers "like old tin cans" and since the bully nations are not deterred by protests, the only way to stop them is to be strong enough to take a stand against them.

Youthful Prof. J. D. Bernal, F. R. S. for his crystallography, told of England's great expenditures for war research in comparison with meager ones for health and other peaceful pursuits. The government must give consideration to the opinion of scientists. Prof. Gordon Childe, of the University of Edinburgh and president of the anthropological section of the B. A. A. S., warned that once war came liberty would be lost, the next time perhaps forever.

The Manchester Guardian's scientific journalist, J. D. Crowther, supplied historical perspective, a young architect told how for \$55 a person Londoners could

be protected in subterranean tunnels against high explosive aerial bombardment, a non-conformist minister emoted over the refugee problem and an economist filled the blackboard with equations involving threats, cooperation, armament costs, time, in hope of predicting when the next war will come.

In a little alley, named Falcon Yard, in a hall above the Cambridge headquarters of the British Legion of war veterans, there was an exhibition illustrating the frustration of science, protesting that food is dumped into the sea when people do not have enough to eat, that medical research is ill supported, that war preparation is the objective of too many research brains today. Sponsored by the Scientists' Group of the Left Book Club, this was an attempt to bring to public attention the social aspects of science as seen by the "left" movement in scientific circles.

### Coordinating Body

The Research Coordination Committee attempting to coordinate, by informational means, the work of many unrelated professional, governmental and other bodies held a conference with Sir Richard Paget in the chair and Sir F. Gowland Hopkins participating. For Intellectual Liberty, a group active in defense of tolerance and freedom, organized an evening meeting, as did the Civil Liberties Association, upholding the rights of trammelled freemen of the British democracy.

During the week of intellectual entertainment provided by the B. A., there was much antidote for the presidential pessimism of Lord Rayleigh's "I doubt whether we can do much."

*Science News Letter, September 17, 1938*

AERODYNAMICS

## Spinning Air Jet Aids Plane Study

**G**ERMAN aeronautical engineers have taken a step toward solution of an old wind tunnel problem—measurement of the behavior of a spinning airplane—by neatly reversing standard procedure.

Instead of making the model spin in a vertical blast of air, M. Kramer and K. B. Krueger have found that spinning the air jet around a fixed model gives better results. More accurate measurement of the forces playing on the plane model and consequently on the full-sized plane under similar conditions can be made in this fashion, they report.

*Science News Letter, September 17, 1938*

## PSYCHOLOGY

# Veterans Think Preparedness Of Little Value For Peace

## United Action to Keep Profits Out of War Believed More Likely to Avert Conflict, Psychologists Are Told

**M**EN WHO have actually seen fighting service have little faith in preparedness as a means for keeping America out of war. Taking the profits out of war would be more effective, they think, a public survey conducted in Ohio and Georgia, and reported at the meeting of the American Psychological Association, revealed.

War is blamed, popularly, on four causes—economic rivalries, national imperialism, munitions makers, and political leaders desiring power, it was discovered by Dr. Ross Stagner, of the University of Akron, psychologist who conducted the survey.

### Little Agreement

But people are less agreed on methods to keep us out of future war. Only two proposals—taking the profits out of war, and the united action of workers, farmers and consumers by strikes, boycotts or similar measures—were endorsed by more than half of those interviewed.

Pacifists and militarists may agree about the causes of war, although there is a slight leaning on the part of militarists toward blaming overpopulation, fighting instincts and love of adventure. But on the possible preventives they widely diverge.

Militarists would keep America out of war by complete military preparedness. They would rely on neutrality laws. Pacifists would first have united action in strikes and boycotts. Next they would take the profits out of war and resort to the League of Nations, socialism, appeal of the churches, business recovery, and diplomatic agreements.

The preparedness group has much more unanimity than has the other more pacifistic groups. "Perhaps," commented Dr. Stagner, "this explains their effective lobbying."

Men with fighting experience are somewhat more cautious in naming the causes of war than those who have not. But 82 per cent. would rely on abolishing war profits as a means of prevention as against only 29 per cent. who think preparedness would be effective and only

4 per cent. who endorse national isolation.

Labor and business are at opposite poles in the measures they would advocate for preventing wars. Labor would abolish war profits, and rely on neutrality legislation, socialism, and an isolation policy. Business thinks business recovery would do the trick and wants preparedness.

If you are thinking of preparing anti-war propaganda, Dr. Stagner recommends two slogans that his study revealed would really be effective. They are:

"Take the profits out of war."

"United Action."

Protection of America's mental health from the depredations of psychological quacks and professionally unqualified persons who set themselves up as psychological counselors was the purpose behind a series of committee meetings which marked the start of the psychologists' meeting.

This action, designed to set off sharply the professional psychologist from the untrained charlatan, was taken at the meeting of the American Association of Applied Psychologists held in connection with the annual gathering of five national associations of scientists in the field of psychology.

### How to Qualify?

One suggestion was that applied or practicing psychologists should spend a full year as internes in an institution just as the medical doctor internes in a hospital. Some psychologists favor this program, which has just been tentatively adopted by Columbia University. Others think that the student for this profession should devote the year to scientific research and should qualify for the Ph.D.

The high scores obtained by some subjects in tests of telepathic card matching can be duplicated by the strictly chance method of matching one deck of cards against another, Dr. Clarence Leuba, of Antioch College, told the meeting.

The secret is in selecting the right "subjects."

The subjects were imaginary in Dr. Leuba's experiments: he merely credited the first ten runs through a deck of E. S. P. cards to one "subject," the next ten to another, and so on.

When the cards turned up from the two decks were of the same suit, a hit was scored. When they differed, it was counted a failure.

If a "subject" scored above the chance expectation for his first ten runs, he was given a second session, that is, another set of runs were credited to "him"; if again successful, he was given a third session. When his "telepathic ability" fell off he was then dropped from the experiment.

In this way 87 "subjects" made a total of 67,050 matchings (2,682 runs through the deck of 25 cards).

### Mechanized "Telepathy"

The average for the whole experiment was only 5.03 hits per run, which is practically the same as the one-out-of-five score you would expect in a deck with five suits, such as this had.

But Dr. Leuba found certain "telepathic subjects" in this way. There were seven "subjects" who averaged between six and eight hits per run for from 200 to 1,000 trials. The results demonstrated the error of selecting subjects in this way for this type of experiment, Dr. Leuba warned.

"Our results are an experimental verification, in this particular field, of the general mathematical principle that anti-chance values are meaningless unless calculated with reference to all the data of all the subjects in all the investigations," he concluded.

A radio audience trying to guess the color or object selected by the announcer in a test of "telepathy," and a student trying to guess the answers in a "yes-no" or "true-false" type of examination, are likely to have some success because audience, announcer, student, and professor are all governed in their selections by certain definite psychological laws. Tests demonstrating this were reported to the meeting by Dr. L. D. Goodfellow of Northwestern University.

If a person is making choices between two objects he naturally follows a symmetrical pattern in his choices, Dr. Goodfellow found. If the guesser believes, however, that chance has determined the order he is trying to match, he makes an effort to follow a haphazard order and so avoids the symmetrical pattern. Since the experimenter or instructor does the same thing, the chances of the two patterns coinciding are increased.



## PUBLIC HEALTH

**Rabies Control Possible  
If Public Demands it**

**R**ABIES, or hydrophobia as it used to be called, is one of those diseases which can be controlled or even eradicated. Apparently few persons realize this fact, however, because in spite of the panic and hysteria that arise in any community at the first cry of "mad dog," public opinion does not demand enforcement of control measures.

Rabies does not exist in Canada or in Great Britain.

"That it is not controlled or eradicated in the United States is uncomplimentary," declared Dr. C. R. Schlottbauer, veterinary scientist in the division of experimental surgery of the Mayo Clinic.

Measures which Dr. Schlottbauer and other scientists know will control the disease and prevent it in humans are: compulsory licensing and vaccination, impounding and destruction of all stray dogs, quarantine of all dogs during the presence of the disease in a community and of all dogs brought in at any time.

Rabies is a highly fatal inflammation of the brain or of the brain and spinal cord. It is caused by a germ which has the characteristics of a virus. The virus is present in the saliva of infected animals. You can get rabies from a dog without being bitten if the infected saliva gets into a wound such as a scratch or bruise.

The common impression that rabid dogs become furious or vicious and foam at the mouth is not entirely correct. The irritable period is usually short and the ensuing mental depression is the symptom most often noted. Vicious dogs may even become more friendly and quiet, friendly ones hard to manage. Rabid dogs will rarely and probably never willfully go out of their way to bite. If not entirely unconscious of their actions, they appear afraid of man and other animals. In the late stages of rabies, dogs may unconsciously bite anything that crosses their path.

*Science News Letter, September 17, 1938*

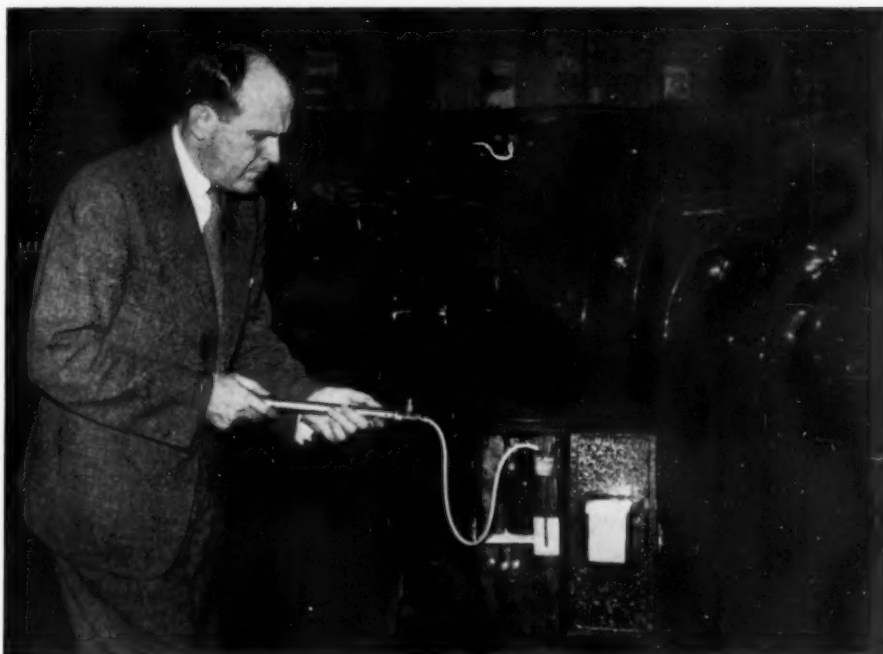
**● Earth Trembles**

Information collected by Science Service from seismological observatories and relayed to the Jesuit Seismological Association resulted in the location of the following preliminary epicenter:

Thursday, Sept. 1, 5:48.5 p. m., E.S.T.

Near the coast of Salvador, Central America.  
Latitude 13.3 degrees north, longitude 89.5 degrees west.

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL August 13.

**MEASURING THE BREATH OF DEATH**

*Inventor Fichlen takes his carbon monoxide measuring device into a garage for a practical demonstration.*

## CHEMISTRY

**Carbon Monoxide Detector  
Developed by Engineer**

**A** MECHANICALLY simple, inexpensive method of estimating the carbon monoxide content of the atmosphere and thus of detecting harmful amounts of this dangerous "automobile exhaust" gas has been developed by J. B. Fichlen, chemical engineer of The Travelers Insurance Company.

Depending upon the conversion of carbon monoxide into carbon dioxide, a gas whose quantity can readily be measured, the device can be built by anyone who desires to do so, Mr. Fichlen states.

An ordinary bicycle pump forces air through a filter which removes carbon dioxide and hydrocarbon gases from the air. This air then passes over an ordinary cigarette lighter coil, which further oxidizes the carbon monoxide to the measurable gas, carbon dioxide. The product is then bubbled through an alkali solution. The carbon dioxide neutralizes the alkali, causing an indicator, phenolphthalein, to lose its reddish color. The number of strokes of the bicycle pump necessary to force enough atmosphere through the system to make the phenolphthalein's color disappear en-

tirely measures the amount of carbon monoxide present in the air. If the capacity of the bicycle pump is known, the concentration of the dangerous CO, as chemists label the gas, can be determined and checked with known facts as to what constitutes a dangerous concentration!

The company announces its intention of giving out specifications for construction of the device to any interested party. Carbon monoxide, which is found in the exhaust from gasoline engines and results from incomplete combustion of the fuel, is one of the most insidious gases known. Not only is it quickly lethal when it passes a certain concentration, but it is odorless and tasteless and hence not readily detectable. Non-lethal amounts of the gas are believed also to have harmful effects in slowing the reactions and alertness of people exposed to it. This has been blamed for many accidents in the past.

*Science News Letter, September 17, 1938*

There is one automobile to 55 persons in Germany, compared to one to every five persons in the United States.

## GEOLOGY

## Rocky Mountain Glaciers Found To be Growing Again

**R**OCKY Mountain glaciers are now growing again after almost ten years of rapid retreat, mountaineers report, as a result of heavy late snows in the higher ranges.

Arapaho Glacier, near Boulder, Colo., reputed to be the largest glacier in the state, is noisily in motion again, after several years of quiescence. When last measured, it was advancing 27 feet a year. This year's motion, according to geologists, may be much greater.

Fair Glacier, whose melt waters are one of the sources of the Colorado River, has grown almost 10 per cent. since 1936, photographs indicate, and the other glaciers in the nearby Crater Lake Hellhole are likewise growing.

Glaciers in Rocky Mountain National Park are either growing or holding their own, each glacier being a separate problem.

Glaciologists point out that this year's glacial advance is not evidence of a new Ice Age to come in the near future, but merely the result of a minor climatic variation, of which several have occurred in the recent past. A slight shift toward wetness brings a glacial advance like the one at present; a slight shift toward dryness brings drought and dust-storms, like those of 1934-36. In a few years, they predict, the glaciers will again be in slow retreat as they were in 1928-30.

*Science News Letter, September 17, 1938*

## PSYCHOLOGY

## Ink Blot Tests Given In Penitentiary

**I**MAGINE asking a hard-boiled criminal to look at an ink blot and tell what he sees in it. It sounds rather fanciful, but it is actually being done as part of a scientific study of delinquency and here is why:

A Swiss psychiatrist, Dr. Hermann Rorschach, found some years ago that a clue to understanding the personality of mentally sick persons might be gained by learning what their imaginations let them see in ink blots. You have probably noticed yourself, as many normal persons have, that a chance blot of ink on your blotting pad looks like a butterfly or a witch or a cat or some other object or creature. Dr. Rorschach believed that the sort of things one sees in ink blots depends on one's personality. Shy, imaginative persons might see ro-

mantic, poetic objects in ink blots, and matter-of-fact persons might see more prosaic objects. So he devised and attempted to standardize an ink blot test which many psychiatrists now use, calling it by his name.

Dr. M. J. Pescor of the U. S. Public Health Service was, as he says in his recent report, "intrigued by the possibility of using it as a routine procedure in studying the mental make-up of delinquent individuals."

"Incidentally," he added, "experimentation might also reveal whether it is really a test or merely a crystal ball in which the examiner may read whatever he wants to believe about his patient."

Consequently he gave the test to 500 prisoners who had been admitted to the U. S. Northeastern Penitentiary during an eleven months' period, and studied the results to see, first, whether the age of the tested person had any bearing on his score.

The age of the prisoners ranged from 17 to 77 years with average of 33.4 years, but the age factor, he concluded, is of no statistical significance in Rorschach Test performance, so far as delinquents are concerned. He did find a tendency for older men to choose original responses and for the younger men to select vulgar replies.

*Science News Letter, September 17, 1938*

## FORESTRY

## Funds Sought for Medal For Forest Fire Heroism

**T**HE AMERICAN Forestry Association has launched a campaign to raise funds to endow an American Forest Fire medal to be awarded each year to an outstanding individual for courageous service in fighting forest fires. Suggested by the U. S. Forest Service, the medal is intended to bring recognition to the fact that forest fire fighting is today one of the most hazardous tasks performed in the United States.

Three thousand dollars is needed to endow the medal. Although a number of large donations have been received, the Association plans to secure small donations from a large number of people in order to spread appreciation of the award.

Any individual or public officer would be eligible for the award after "unquestionable evidence is presented that he has performed an act worthy of consideration for such an award," according to a Forest Service statement. The medal may be awarded posthumously.

*Science News Letter, September 17, 1938*

# IN SCIENCE

## BOTANY

## Hayfever Pollen Found At 9,000 Feet Altitude

**H**AYFEVER pollen grains fly high, Oren C. Durham, botanist of the Abbott Laboratories, discovered in the course of a week's research cruise back and forth across the ragweed belt in transport planes of the United Air Lines. But despite the presence of pollen in the air outside, passengers within the big cabin planes were safe from sneezes. The pollen concentration inside was practically zero.

Pollen ceilings had previously been reported as varying from 3,000 to 4,000 feet. In this survey the ceiling was found to vary from 4,800 to 9,000 feet above the ground. Heavy concentrations of pollen were found over northern Ohio and Indiana up to about 6,000 feet. Small amounts of pollen were found in eastern Colorado as high as 9,000 feet above the ground. Definite pollen ceilings were found to be marked by cloud layers, whether these layers were continuous or merely consisted of numerous cumulus clouds.

In perfectly clear skies there seems to be no well marked level at which pollen contamination stops. Rain interfered considerably with the study, clearing the air of pollen at certain low levels and hindering exposures part of the time.

*Science News Letter, September 17, 1938*

## BIOCHEMISTRY

## New Vitamin Discovered By Nobel Prize Winner

**R**ECENTLY discovered and synthetically prepared by Nobelist Adolf Windaus and his colleagues at the University of Göttingen is a new vitamin, designated as Vitamin D<sub>2</sub>, which has been proven highly effective in preventing rickets in young chicks.

Hint of its existence was given when it was found that purified Vitamin D<sub>2</sub> was less effective in preventing rickets than the tuna fish oil from which D<sub>2</sub> was extracted. This led to the suspicion, confirmed by experiment, that the oil contained another, hitherto unknown vitamin.

*Science News Letter, September 17, 1938*



# CE FIELDS

## GEOLOGY

## New Hot Springs Area In Yellowstone Park

A NEW area of thermal activity, previously unreported and not included on any previous maps of the region, has been found a few hundred yards back of the grand loop highway system between Norris and Madison Junction in Yellowstone National Park by Superintendent Edmund B. Rogers.

The discovery was made by Superintendent Rogers while on a hiking trip into an adjacent hot springs area. Noting a steam column rising from the side of Paint Pot Hill, the superintendent and his party walked in that direction.

They found a sizable area including a multitude of small nozzles looking like miniature geyser cones. Each nozzle was a steam vent. The basin is unusual, the superintendent said, in that it is covered with white quartz sand. Hot springs in the park are usually surrounded by travertine and geyser basins have floors of silica or geyserite.

*Science News Letter, September 17, 1938*

## BIOCHEMISTRY

## Food Vitamins Unharmful By Freezing Methods

WITH modern canning and cold storage methods there is little or no loss to the vitamin content of foods. In fact in some cases of fruits and vegetables the canned variety may show a higher vitamin content than the usual "fresh" products that the ordinary housewife can buy at the market.

The reason is that, for vitamin C at least, the canned fruits, juices of vegetables are packed quickly at harvest before time permits the oxidation that results in vitamin C losses. The so-called fresh fruits and vegetables, sometimes stored for long periods, gradually lose their vitamin C content and may be inferior, in this respect, to the canned varieties.

Such, in summary, is the finding of Prof. R. Adams Dutcher of Pennsylvania State College. He cited the following as the human needs for vitamins and the known facts about vitamin preservation:

Vitamin A is needed to aid in preventing infection, for normal vision and normal growth. It is preserved by cold storage. Canned vegetables compare favorably, in vitamin A content, with the fresh variety.

Vitamin B<sub>1</sub> acts as a nerve stimulant. It is not destroyed by low temperature storage.

Vitamin B<sub>2</sub> is required for the proper functioning of the gastro-intestinal tract and the maintenance of a healthy skin. Enough is not yet known about it to give evidence on the effects of canning or cold storage.

Vitamin C prevents scurvy, helps the preservation of normal denture and gives strength and elasticity to the blood vessels of the body. Proper canning and proper refrigeration tend to preserve it.

Vitamin D prevents rickets by aiding the proper utilization of calcium and phosphorus in the bones and teeth. It is very stable and presents no preservation problem.

Vitamin E is the antisterility factor in the diet, is stable to heat and is easily preserved at ordinary temperatures.

*Science News Letter, September 17, 1938*

## SURGERY

## Appearances Improved by Plastic Surgery Methods

THE beauty of personal appearance as well as health is a concern of the surgeon now that plastic surgery techniques have improved so remarkably in the years since the World War. Plastic surgery has an esthetic as well as a reparative objective; it remedies the looks and appearances of individuals who enjoy good physical health but are weighed down psychologically by some deformity of appearance.

The deformity may be a flat, hooked, long, crooked or bulbous tipped nose. It may be a turkey gobbler or scrawny neck, a harelip, drooping eyelids, pendulous breasts, adipose tissues on the arms, legs or abdomen. Or it may be ugly scars, the tombstones of injuries. Thick lips, excessive wrinkles, outstanding ears, a receding or double chin, moles or birthmarks can also be remedied by the surgeon's knife.

One of the practitioners of this branch of surgery, Dr. Henry J. Schireson, of Philadelphia, tells in a book, "*As Others See You*", the fascinating details that will interest the layman. He feels that surgery for esthetic and psychological reasons will be as commonplace in another five years as neatness and cleanliness are today.

*Science News Letter, September 17, 1938*

## PHYSIOLOGY

## Ten Bricks of Protein Food As Necessary As Vitamins

WE HAVE heard much about vitamins and the necessity of having them in the food we eat. But did you know that one of the three long recognized food classes, the protein of the famous carbohydrate-fat-protein trilogy, contains substances that are just as essential to growth and life itself?

The amino acids, as they are called, are as essential factors in our diet as the vitamins. And there are more of them. They are the building blocks out of which the proteins of foods—beefsteak, cheese, etc.—are constructed.

For thirty years the relationship of these amino acids to growth has been studied, but since 1930 there has been an extensive push in the laboratory at the University of Illinois presided over by Prof. W. C. Rose.

Until recently there were only three of these compounds that had been shown to be indispensable components of food. Their names were tryptophane, lysine and histidine. Now through patient animal experimentation with foods whose protein content consists of carefully purified amino acids of various kinds, Dr. Rose and his co-workers have a list of ten amino acids finally classified as "essential to growth." They are in addition to the three previously so cataloged: phenylalanine, leucine, isoleucine, threonine, methionine, valine, and arginine.

Dr. Rose classes the other 12 of the known 22 amino acids as non-essentials so far as growth is concerned. Among them is cystine, one of the better-known amino acids, which previously was widely considered an indispensable component of food.

*Science News Letter, September 17, 1938*

## BACTERIOLOGY

## Young Bacteriologist Wins Eli Lilly Prize

DR. JEROME T. Syverton, assistant professor of bacteriology at the University of Rochester in Rochester, N. Y., was awarded the Eli Lilly and Company prize of \$1,000 and a gold medal for the outstanding contribution made during the past year to bacteriology and immunology by an American scientist under 31 years of age. The award was granted in recognition of Prof. Syverton's contributions to knowledge of the filterable viruses. He is 31 years old.

*Science News Letter, September 17, 1938*

METALLURGY

# Mining a Mountain

## Bartlett Mountain, in Colorado, Once Cursed Because It Held No Gold, Now World's Chief Molybdenum Source

By RONALD L. IVES

THERE wasn't any gold in Bartlett Mountain. Miners found only a shiny black mineral that contained sulfur and something else whose name they couldn't even pronounce. They cursed Bartlett Mountain with colorful vehemence, and moved on to other mountains, where there was more gold—they hoped.

Today, when most of the gold and silver mines in the Leadville area are closed down, or worked out, Bartlett Mountain is trembling with activity. That "useless" black mineral on which the prospectors turned their backs makes this one of the most important mountains in the world. It insures that no matter what happens, American automobiles will have flexible springs, our airplanes strong wings, our warships tough armor and powerful guns. For it is the ore of molybdenum, one of the most important of all alloying agents used in the making of modern steels.

Three-quarters of the world's supply of "Moly," as it is nicknamed for short, comes from this one mountain. They are tearing 10,000 tons of the ore out every day now, and there is more than 160,000,000 tons of it still in the mountain—how much more, nobody knows.

### It's Hard to Say

Miners still can't pronounce that word, molybdenum. (Well, can you, either, at first try? *Mo-lib-d-num*—that's about it.) Locally, it came to be known as "Molly-bend-um," and the miners are still referred to as Molly-benders—when they aren't within hearing.

Moly is a peculiar metal. Until a few years ago, it was just a chemical curiosity, mentioned in the books, but not used for anything. It is still worthless—by itself. Only when it's alloyed with other metals is moly worth anything, but then it's so valuable that the crude mineral, molybdenite, sells for almost half a dollar a pound. It's something like the yeast used in baking. Yeast is not very edible, and not very expensive, but added to dough before baking it changes hardtack to bread.

Moly, as it comes out of the mill for shipment, doesn't look very spectacular.

Almost anyone would mistake it for graphite. Pioneers tried to use it for greasing axles, but it didn't work very well. When it's heated, moly smells like burning sulfur. Later, after refining to calcium molybdate, it is a whitish or grayish powder, looking like pulverized plaster-of-Paris. Steelmakers prefer the calcium molybdate, or an alloy of moly and steel, to the crude ore, because the sulfur in the ore makes steel "short," or brittle.

### Everything Different

Even the ore body at Climax is different. Most ores occur in veins or blanket deposits, with definite boundaries. At Climax, the molybdenum ore is found in an inverted cone within the mountain, with the workable mineral at the outside. Inside of the rich zone, which contains seven or eight pounds of molybdenum sulfide to the ton, is a zone of leaner material, which cannot be profitably mined, while on the outside the molybdenum values fall off gradually until the ore is not worth mining.

Chemists, analyzing the ore daily, tell the hard-rock men just how rich, or how lean, the ore is in a given bore. Then, as they prepare for the blasts, they can tell just how much ore is worth breaking down. Too much lean ore will make the mill run at a loss, too little lean ore leads to wasteful mining, and depletion of the reserves.

Mining is always hard work, but mining the weirdly-shaped ore body at Climax is particularly difficult. There is one-third less air to breathe at two miles above sea level, and the mountain winters are long. Men tend to "burn out" at high altitudes, and tempers become short toward the end of a long mountain winter. Mechanized mining, high wages, and excellent living conditions offset most of the troubles due to altitude, but not all. Sun lamps, installed to give the men their quotas of ultraviolet light during the long winter season, are the latest move to keep the men well.

A ton of molybdenum ore has only a few pounds of molybdenite, the valuable mineral, in it. Hence, the ore is not worth more than the value of the moly in it, and this is only three or four

dollars a ton. Out of these few dollars must be paid the cost of getting the ore out of the mine, the cost of getting the mineral out of the ore, and the general expenses of the mine, such as interest, taxes, repairs, etc. If there is anything left over, that will be the profit.

In a great many mines, it costs from \$3 to \$10 a ton to get the minerals out of the ore. This exceeds the value of the Climax ore, so special methods had to be worked out. Today, by using these, the ore is handled at a cost of about \$2 a ton. This leaves from \$1 up to pay the tax collector, and the stockholder, and the repairman, and to care for the thousand and one other expenses of a mine.

Getting the ore out cheaply necessitated large-scale operations. They don't blast every day at Climax—they blast once or twice a year. A few years ago, Climax hard-rock men worked almost a year preparing for one blast, then shot 110,000 pounds of explosives all at once, bringing down three-quarters of a million tons of ore. The shock of the blast was felt in Denver, across two ranges of mountains from Climax.

### Blasts Without Fuses

Perhaps you will visualize some grizzled mining foreman running around through miles of workings under Bartlett Mountain, lighting each carefully-measured fuse with his miner's lamp, then running on to the next, and finally, after an hour's hectic work, dashing madly out to shelter just before the first blast let go? It's a romantic picture, but it didn't happen. The big blasts at Climax are fired electrically, and aren't very spectacular to the average person. A dull rumble and a trembling of the ground are all that can be noted immediately, then a few puffs of powder-smoke from cracks in the mountain's flanks.

Local legends tell of a warning call to the seismologist in Denver, so that he can guard his seismograph against the sudden shock of the blast, which resembles a minor earthquake. After the blast, which is only one step in the mining operations, the air in the bowels of Bartlett Mountain slowly clears of the powder fumes, and men go in to remove the blasted-down ore.

It's a long step from the hand-steel-and-black-powder methods, with manual loading and mules for hauling the

cars, to the present big blasts, power loading and electric haulage, but the new methods made moly mining profitable instead of prohibitively expensive. After the blasts inside the mountain, the ore is dragged by machine to a chute, down which it slides into cars holding about ten tons each. A thousand carloads a day is now the regular output of the mine. Twenty-five carloads make up a train, which is hauled out to the mill at the foot of Bartlett Mountain, but still two miles above sea level.

Getting the ore out of the mine has now been done—drill, blast, scrape, haul, and it's done. Skilled hard-rock men, powerful machines, careful planning, all are necessary to do the job cheaply, quickly, and safely. The lowest-paid help at Climax get \$4.50 a day; many skilled men get more, and the work is very steady.

### Tedious Refining

Next begins the wearisome task of getting the molybdenum sulphide out of the ore. In each 2,000 pounds of ore are about seven pounds of sulphide. Unless the ore is treated as fast as it is mined, it will pile up, using space where space is at a premium, and need rehandling. The ore trains dump their loads directly into the mill, and the rock is crushed and ground as the first step in refining. No rock particle may be any larger than the smallest ore particle that should be recovered.

Grinding equipment, which must be economical, and must work thoroughly, is arranged in "closed circuit" with a classifier. Each particle that is ground to the desired smallness is removed by the classifier, while the larger pieces of ore go back to be ground some more. After grinding, the ore, now a gritty muck, goes to flotation cells, where the molybdenite is separated from the unwanted rock by the action of pine oil. The rest is simple—the rock is carried by water to the tailings pond, while the moly goes to a dryer, and then is barreled for shipment.

Mill men at Climax have a problem in economics that never ceases. If they recover all the moly in a ton of ore, it costs more than the moly is worth. If they let some of it go through to the tailings pond, they make a profit, while if too much goes out with the tailings, they again lose money. Careful adjustments of every stage of the milling process keeps the recovery around 90 per cent., which is the most economical value.

A mill man is more than just a machine operator. He must know how to

operate the machines, it is true, but any darn fool can learn to do that. A man can study ores for years, gaining several college degrees in the process, and still be no good as a mill man. Great experience, and the development of the trait called "savvy," make a mill man good, and once he is known as a "good mill man" he has no more job worries. Like the highly skilled worker in almost any field, he is always in demand.

### Finished in East

Concentrated ore is stored in the local warehouse until ready for shipment, then is hauled eleven miles through the mountains to Leadville, where it is loaded on the standard gauge railroad for shipment to seaports, users, or the company's refinery at Langeloth, Pa., where the molybdenum sulphide is converted into more usable compounds, such as calcium molybdate or ferromolybdenum. These are shipped from the refinery to users.

Roads between Climax and Leadville must be kept open, even when the mountain snows cover the scrawny trees of the timberline zone. One engineer is kept busy continually by the constant battle with mud, snow, sleet, and balky machinery. Ore can wait, if necessary, but supplies for 1200 men, fuel, machine parts, and mine timbers must come to Climax regularly. There must be no delays. The mine and mill must be kept operating at maximum efficiency, each delay or stoppage costing hundreds or

thousands of dollars. The transportation engineer's job is just as important and responsible as the boss hard rock man's.

Miners call the narrow-gauge locomotives "teakettles on wheels," but they are designed for pulling heavy loads up heavier grades. Getting there, not speed, is the important factor. Not far from Leadville, in the good old days, when this road was still operating to Denver, a circus train stalled on a heavy grade, and threatened to tie up travel in both directions until the elephants got out and helped push. Soon, according to present plans, a standard gauge railroad will be built into Climax from Leadville, saving the trucking and rehandling costs.

### Long Uphill Fight

Moly didn't have a meteoric rise as a steel alloying agent. Twenty years ago it was a curiosity. There was a grim battle with expiring options, skeptical buyers, and balky refining processes, before the mine really went into operation. The early work was done by hand, in the thin air of the high country.

Today, a dozen metallurgists sell the output of the mines. They aren't salesmen in the usual sense. Their job is not to buy drinks for possible customers until they sign the order, but to show what moly will do, and back up their statements with records of past performances. A moly salesman truly has "nothing up his sleeve." He can't have. His job is to sell moly—not just one order, but to



### FREIGHT ROAD INTO THE MOUNTAIN

*This twelve-foot tunnel into Bartlett Mountain will provide room for a double-track railroad for the more rapid removal of the molybdenum ore.*



create new uses for it, uses so valuable to the buyer that he will order moly year after year.

Several other areas in the world are small producers of moly. Climax produced 15,000,000 pounds of concentrates in 1936, the last year for which figures are available. Total U. S. production during the same year was only about 17,000,000 pounds. Mammoth, Arizona, produced a little more than a million pounds of moly concentrates during that year, and the remaining million pounds came from New Mexico, Utah, and Washington. The other 3,500,000 pounds of moly produced that year came from ten different countries.

Wartime use of moly, as a hardener for armor plate, a toughener for cannon, and for lightening aircraft, increases the strategic value of the Bartlett Mountain moly deposits, but their real value is in peacetime industry. Moly is about the only steel-alloying material which is plentiful in the United States, although we are the world's greatest user of alloy steels. When a tougher, or harder, or more temperature-resistant steel is needed, the engineers of the various mills try moly, and often they find that it, or a combination of moly with nickel, or tungsten, or chromium, will do the job. Climax engineers cooperate in these researches.

Twenty years ago, you couldn't sell a ton of moly at a profit. Today, the mines must be worked continually to meet the demand, and they never seem to quite catch up. Will the increasing use of alloy steel, particularly molybdenum steel, bring a new era to metal manufacture? Many engineers think it will.

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Science News Letter, September 17, 1938



#### READY TO ROLL

*Last stage before it starts on its travels: the "moly" concentrate, now practically pure molybdenum sulfide, is packed in stout barrels.*

#### CHEMISTRY

### Chemical in Water Stops Corrosion of Iron Pipes

**C**ORROSION of iron water pipes, particularly those carrying hot water, can be markedly decreased by adding a small amount of sodium sulfide to the water to combine with the free oxygen present in it, scientists of the Kaiser Wilhelm Institute have found.

The free oxygen is the substance primarily responsible for rusting the pipes. The substance left by the combination of the oxygen and sodium sulfide is harmless.

Science News Letter, September 17, 1938

#### ENGINEERING

### Rubber Bearings Used In Underwater Work

**A**DD RUBBER to your list of unusual materials now being used for surfaces of bearings. Copper, lead, babbitt metal, rarer cadmium and indium, even silver, are the best known members of the bearing family for they all possess special properties of toughness, long wear, corrosion resistance or other desired characteristics. Flexible, yielding rubber seems a strange addition to this bearing family.

And yet, when you study the places where rubber bearings find usefulness the application of rubber is not too surprising. Pumping systems for drinking water and many solutions used in the preparation of foodstuffs or beverages comprise one application. A few others would include: high-speed motor boats, underwater marine work, hydraulic turbines, centrifugal pumps, agitators, washing machines and domestic and industrial liquid-handling equipment.

Secret of rubber's usefulness as a good bearing material is its ability to suffer slight displacements and yet keep a tight fit. Thus a grain of sand or other hard particle only makes the rubber surface give and does not force the particle into the axle, or bearing surface.

As reported to the Institution of Mechanical Engineers in London by Sydney A. Brazier and W. Holland Bowyer, water or other fluid, and not oil, is the lubricant with rubber bearings. A series of slots are provided in the bearing and the fluid passes, rather freely, through these interstices so that it can wash out dirt particles and also remove heat, for rubber's heat conductivity is so low that this factor is a problem in the use of these novel bearings.

Science News Letter, September 17, 1938

Brook trout bury their eggs in beds of clean gravel in autumn, generally in spring-fed headwater streams.

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## CHEMISTRY

# American Chemists Skeptical Over Hitler's Self-Sufficiency

## Metals, Petroleum, Other Materials Essential in Both Warfare and Industry Cannot be Supplied Within Reich

CHEMISTS attending the American Chemical Society meeting in Milwaukee were almost unanimous in declaring that Germany is not in any condition technologically to fight a war, Hitler's boast of self-sufficiency notwithstanding.

Dr. Harrison E. Howe, editor of Industrial and Engineering Chemistry: "While Germany has done some remarkable things in science and technology during its four-year plan, the results to date do not supply an adequate foundation to support such a bluff."

Dr. Charles A. Kraus, of Brown University, president-elect of the American Chemical Society: "I doubt if any nation in the world is self-sufficient in all materials vital for fighting a long war. Germany is one of the nations seriously lacking in many essential materials. You can't make metals synthetically."

There was general agreement that petroleum is Germany's greatest lack. Information received by J. H. Bruun and A. V. Hill, of the Sun Oil Company, shows that hydrogenation of coal into oil is not sufficient to supply war needs of transport and mechanized units. Hydrogenation in peacetime can supply only 80 per cent. of the need, which would be only 25 per cent. of war needs. A few months of fighting would exhaust oil supplies.

Dr. Foster D. Snell, Brooklyn, N. Y., consulting chemist: "Because of diversion of foodstuffs, particularly fat, from Germany's food supply which have already been made, Germany would start a war with one strike against it. A nation ordinarily starts a war with its people physically at normal. There is a serious question whether Germany is at present in this condition or whether its

population may not be already showing the effects of past diet changes."

Rubber supply in Germany is now better than it was during the World War, according to J. C. Hunt, du Pont chemist. Artificial buna rubber is rather effective material although its cost is high. But Germany does have the raw material for making it.

Germany lacks tungsten and molybdenum, metals essential in making steel for her war machine. Its source of these metals is Sweden. Aside from the matter of foreign exchange for paying for imports, a rising feeling against the Nazi in Sweden may hamper obtaining these needed metals.

American scientists thus expressing skepticism received unexpected support from a source within the Reich. In the German popular science journal, *Die Umschau* (Aug. 28), Dr. Werner Hofmann, official food chemist of the Bakeries Institute in Berlin, tells of his efforts to find replacements for the fats now used in the baked-goods industries, and to reduce the total quantities used.

Among the substitutes he mentions peanut oil, palm oil, soybean oil, even whale-oil. It was necessary to harden all of them by hydrogenation before passable results could be obtained. Soybean oil, from which great results were anticipated, proved especially disappointing. The oil has a persistent, strong, "beany" taste; also it tends to come out on the crust, making the products "greasy and messy."

*Science News Letter, September 17, 1938*

## WEATHER

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## MEDICINE

## Watch Your Weight for Your Heart's Sake

PROBABLY most people who watch their weight do so because of concern over their figures. Consideration for your heart is a much more important reason for being scale-conscious.

Excess weight gives the heart too much work. If you are underweight, on the other hand, the heart beat and the circulation are slowed, your heart shrinks in size and you are more liable to serious complications following minor infections and injuries and you are what is called a poor surgical risk.

The importance of diet in relation to the heart was recently pointed out by Dr. Louis A. M. Krause, of the University of Maryland, in an address under the auspices of the Baltimore City Health Department and the Medical and Chirurgical Faculty of Maryland.

"In the past," Dr. Krause said, "heart and blood-vessel disease was thought to be due solely to the changes caused by germs, or by developmental defects. Of late we have learned that nutrition is a problem of primary importance and, in many instances, that improper nourishment results in defective heart action. It may be that the faulty nutrition permits the entry of some disease germs."

The average adult's heart pumps about six quarts of blood every minute, or 2,000 gallons every day. Someone has figured, Dr. Krause said, that there are five miles of blood vessels in every pound of fat. So you can see how much extra work you are giving your heart with every pound of surplus weight.

It is the fatty foods and the sweets that add on the surplus weight, it appears, except in cases of glandular disorders. An excess of vegetables or animal protein (meat) apparently never causes heart or blood-vessel disease.

*Science News Letter, September 17, 1938*



Ancestor-Hunting

See Front Cover

**C**ORN has long been one of the greatest of botanical riddles. Nobody has known where it came from. Wild forms of most other grains are known, but corn has remained a botanical orphan. Not only does it lack any identified ancestors, but it has only two cousins in the Western Hemisphere: teosinte, which is a Mexican fodder plant, and a wild grass named *Tripsacum*.

Now come two Texas scientists, Dr. P. C. Mangelsdorf and Prof. R. G. Reeves, with strong evidence that the ancestor of corn is corn—a primitive type of grain known as pod corn, in which each grain is covered with a tiny individual husk of its own. Pod corn is unknown in the wild state, but even as a cultivated plant it has certain definitely "wild" characters.

One suggestion that has in the past had the support of some botanists, namely that teosinte is the ancestor of corn, they dispose of very neatly by adducing good genetical evidence that corn is one ancestor of teosinte, the other being the related grass *Tripsacum*. They hold that teosinte originated as a natural hybrid, probably when the migrating Mayas, about A.D. 600, carried corn into the natural range of *Tripsacum* in Mexico.

One difficulty about the wild pod

corn hypothesis is that the Peruvian Indians, who without much question originated corn culture, are the only ones who do not grow pod corn at all. But, reasoned the two scientists, not unlikely the Peruvians had carried their agriculture to such an advanced stage that they discarded pod corn long ago, while less advanced Indians still used it.

So they leafed through old manuscripts, examined effigy pottery from the

very earliest known Peruvian culture levels. Finally, at the Peabody Museum of Yale University, they found a faithful replica of a prehistoric ear of pod corn.

They do not feel that the wild form of corn is necessarily extinct. It may still exist, they think, in the little-explored unforested lowlands of southwestern Brazil, Bolivia, or Paraguay.

*Science News Letter, September 17, 1938*

## AGRICULTURE

## Research and Education Remedies for U.S. Soil Ills

**U**NCLE SAM, in the persons of Secretary Wallace and his fellow-scientists of the Department of Agriculture, look long and thoughtfully at the fields that raise America's food and clothing, in the new Yearbook of the U. S. Department of Agriculture. The whole book concentrates on one subject: the soil and problems arising out of its neglect and abuse. There is about its contents that which suggests a group of physicians in consultation.

Erosion by wind and water, the invisible erosion that is fertility exhaustion, too large crops and too low prices, share-cropping, pauper tenancy, overload of debt—these and other ails that have received much attention in public discussion are looked upon as symptoms behind which they are trying to go, seeking fundamental causes that may be treated with basic remedies.

The causes suggested are many, and most of them interlock—like concurrent pathological conditions in the human body. Our traditional land-tenure policy, like most of the rest of our national economic life, has been a natural outgrowth of eighteenth century liberalism—laissez-faire on the land. As an extension of that principle, we have been content to let every farmer work his land any way he pleases, with the idea that if he does so badly or ignorantly he takes the consequences. The trouble, however, has been that resulting bankruptcy hits not only the farmer but the soil itself, and thus becomes a matter of public concern.

Another contributing cause of sickness of the soil has had its focus in the pocketbook. Our systems of farm financing and land taxation have tended to bear more heavily just when they should have been lightened, so that the harassed owner and the still more harassed tenant

have been pressed into mining the soil, and plowing up sodlands that they usually knew should have been left unbroken, in order to meet fixed charges.

These are only a few of the symptoms looked at in the new yearbook. But the Department researchers are concerned even more with the search for remedies.

Characteristic of Secretary Wallace's perennial insistence upon the value of scientific research is the No. 1 position given to research and education in the list of things that need to be done. More facts must be found, even where the known facts stare one in the face like a clay-hill gully or a dust storm. Out there in the dark, beyond the horizon of things we know, may lie keys to difficulties that now baffle us.

But with facts discovered and told to the people through all educational means, the bridge to recovery may still be lacking. Just as it would be of no use to tell a tubercular patient to eat eggs and drink milk when he hasn't even the price of cornmeal, so it can be of little assistance to the farmer to tell him what's wrong and how it can be righted if he lacks the means to put good doctrine into practice.

Here is where the economists have their innings. Needed treatments they outline range all the way from quick palliatives in the form of direct monetary aid, through assistance in the enhancement of soil fertility and the stabilization of slopes, to programs for the long pull such as gradual retirement of submarginal lands and restoration of ecological balance to regions that have been indulging in maladapted cultivation practices.

The book bulks to more than 1200 pages, so that more than the sketchiest hint of its temper and drift can not be

## • Radio

Every Friday at 7:30 p. m. EDT, 6:30 p. m. EST, 5:30 p. m. CST, 4:30 p. m. MST, or 3:30 p. m. PST, Science Service cooperates with the Columbia Broadcasting System in presenting over the Columbia coast to coast network a new series of "Adventures in Science" presenting dramatizations of important scientific advances and discussions by eminent scientists.



given in a short review. In limiting itself to the full discussion of a single large topic, it is following the lead established in the preceding two yearbooks, which thoroughly worked out the subject of agricultural genetics.

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## PSYCHOLOGY

## Few Recreation Interests Are of Life-Long Value

**C**HURCH-going still leads as a leisure-time activity, if a sample of the Missouri population may be considered as typical of Americans in general.

And church-going is one of the few interests that do not fall off with increasing age, according to a survey conducted by Dr. Eugene S. Briggs, of Phillips University, Enid, Okla., and reported to *School and Society*.

Old age and increasing enforced leisure seem inevitable, unless one is to escape through death. Yet it is surprising how many of our recreational interests are those that do not appeal to the aged.

Even the movies fail to hold the elderly, those who never attend increasing steadily from 18 per cent at 20 years to 50 per cent at 40 years, 72 per cent at 60 years and 100 per cent at 90 years, Dr. Briggs found.

Card playing, dancing, radio listening, and even the entertaining of friends lose interest as we grow older, it seems.

Age does not affect concert or lecture attendance.

Hobbies are enjoyed by only 39 per cent of adults, but appeal particularly to men and women between 65 and 75 years of age, 95 per cent of whom ride a hobby. Hobbies hold the better educated and the city dweller, Dr. Briggs discovered.

Athletic sports are not participated in much by adults, even if horse shoes are included, Dr. Briggs said. Only one in ten country folks play athletic games as often as once or twice a week. Here again the interest wanes with increasing age.

Of all adults who read newspapers, 40 per cent find recreation in so doing. A similar percentage find recreation in reading magazines.

Books are not very popular, for 60 per cent have read no books in the past six months. And if you think that books are neglected only by those remote from libraries, you are due for a surprise. The greatest number of non-readers of books were born in the city.

*Science News Letter, September 17, 1938*

# \$1000 AWARD FOR BIOGRAPHY OF THE UNBORN

by MARGARET SHEA GILBERT

*I*N COMPETITION with men from all over the world, Mrs. Gilbert won the \$1000 award offered by the publishers for the best manuscript on a science subject for general reading. Incidentally she won the contest just a month after her first baby was born.

The committee judging the anonymous entries consisted of:

LYMAN BRYSON  
*Columbia University*

HARRY HANSEN, Book Review Editor  
*New York World-Telegram*

JOSEPH WHEELER  
*Enoch Pratt Library, Baltimore*

DAVID DIETZ, Science Editor  
*Scripps-Howard Newspapers*

### Life Begins

at an unfelt, unknown, and unhonored instant, when a minute wriggling sperm plunges headlong into a mature egg.—After twenty-five days the first heart beat—A simple brain—First kidneys to be lost again—An increase of 8000 times in weight.

### Then—

A face, limbs, much of muscles and a bit of skeleton —The liver starts secreting. Kaleidoscopic changes in the sexual organs — Vocal cords ineffective like broken violin strings — The fetus thrusts arms and legs—Hair, nails and a wrinkled skin—The descent of viscera explains a puzzling waste of nerve growth.

### Finally—

The eyelids, fused shut since the third month, reopen — Nervous system and brain develop—Fat is formed, the old-man look is lost — The fetus has hiccoughs, may suck his thumb—Exodus and adjustments.

### Read This Biography

The stream of life flows more swiftly here than ever after. Half a lifetime is lived during the first two months, if time is measured by internal events and changes.

Harry Hansen thus expressed his opinion: "I have never encountered the story of human life in such intelligible and exciting terms before, and I believe the author has succeeded in everything she set out to do. No one who reads it can help being interested in this high adventure of being born."

*Illustrated, 142 pages, Glossary, index. \$1.75.*

"Highly recommended" by the Scientific Book Club as an especially fine piece of expository writing.

THE WILLIAMS & WILKINS COMPANY, Baltimore

# •First Glances at New Books

## Current Events

1938 BRITANNICA BOOK OF THE YEAR—Franklin H. Hooper and Walter Yust, editors—*Encyclopaedia Britannica*, 747 p., \$10. Up-to-date, even to generous use of candid camera portraits, this annual trailer to the Britannica offers encyclopedic data on events and topics of 1937, starting with the death of a Turkish poet named Abdulhalik Hamid and ending with the year's progress in Zoology.

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## Chemistry

LIBRARY GUIDE FOR THE CHEMIST—Byron A. Soule—*McGraw-Hill*, 302 p., \$2.75. Realizing the importance of knowing where to look for chemical information, the author has written an extremely useful book which is, in effect, a road-map to the many paths of chemical knowledge. It begins by describing the arrangement of chemical books in libraries; it tells not only how to get the most out of a card catalogue, but how to use the many abstracts, journals and reference works which save the reader much time and toil—if he knows how!

*Science News Letter*, September 17, 1938

## Ichthyology

STANFORD ICHTHYOLOGICAL BULLETIN, Vol. 1, No. 1, June 22, 1938—*Natural History Museum, Stanford Univ.*, 50 c. per copy. A new journal founded to furnish a publication outlet for ichthyological studies at Stanford University, for which it has become increasingly difficult to find adequate space in existing journals. Special attention will be given to taxonomy and morphology of fishes. The initial number is given over to a paper by Margaret Storey, on West Indian Clupeid Fishes of the Genus *Harengula*.

*Science News Letter*, September 17, 1938

## Zoology

ANIMALS OF THE SEASHORE—Horace G. Richards—*Bruce Humphries*, 273 p., \$3. An elementary book on marine zoology, that will be useful alike to student and amateur collector. It covers the Atlantic coast of the United States, particularly the part of it north of Cape Hatteras.

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## Psychology

EXPERIMENTAL TELEPATHY—René Warcollier—*Boston Society for Psychic Research*, 296 p., \$3.50. Also published by *Harper*, 250 p., \$3. Edited and

abridged by Gardner Murphy from *La Télépathie*, articles in the *Revue Métapsychique* and recent unpublished studies. The two editions are identical except for the omission in the *Harper* edition of two chapters entitled: The Relation of Telepathy to the Subconscious and the Unconscious, and The Nature of Telepathy.

*Science News Letter*, September 17, 1938

## Entomology

LASIUS, THE LUCKY ANT—Nina A. Frey—*Dutton*, 95 p., illus., \$1.50. Events and adventures in the life of a black ant, vividly yet naturalistically told. Children will like this book—and what they will learn from it will never have to be unlearned. It's good, straight, simplified natural history.

*Science News Letter*, September 17, 1938

## Botany—History

FAMOUS TREES—Charles E. Randall and D. Priscilla Edgerton—*Govt. Print. Off.*, 116 p., 15 c. (U. S. Dept. of Agr. Misc. Publication No. 295). Trees associated with famous personages, from George Washington to the Duke of Windsor, Dan'l Boone's "b'ar tree", trees that founded whole land industries like the Washington navel orange, trees that witnessed treaties, noteworthy giants of all species, are among the great ones of the forest this interesting bulletin tells about. Schools, Scout troops, and good Americans at large will want to read it.

*Science News Letter*, September 17, 1938

## Plant Geography

THE DISTRIBUTION OF IMPORTANT FOREST TREES OF THE UNITED STATES—E. N. Munns—*Govt. Print. Off.*, 176 p., 35 c. Except for half-a-dozen pages, mostly table of contents and index, this publication consists entirely of distribution maps of the more important tree species of the United States. Everybody interested in trees, from veteran foresters to high school botany students, will find these maps useful.

*Science News Letter*, September 17, 1938

## Sociology

GROUP ADJUSTMENT: A STUDY IN EXPERIMENTAL SOCIOLOGY—Wilber I. Newstetter, Marc J. Feldstein and T. D. Newcomb—*School of Applied Social Sciences, Western Reserve U.*, 154 p., \$2. Research into the problem of expressing social interaction in quantitative terms was conducted at a school intended principally for problem children and is here reported.

*Science News Letter*, September 17, 1938

## Astrophysics

THE SUN, ITS PHENOMENA AND PHYSICAL FEATURES—Giorgio Abetti; Trans. by Alexandre Zimmerman and Frans Borghouts—*Van Nostrand*, 360 p., \$5. A leading Italian astronomer tells everything that is known about the physics of the sun, to date. Having the results of recent researches thus digested and collated will be exceedingly useful to both observers and teachers. Particular attention is paid to the notable American researches of the Smithsonian Institution and the Carnegie Institution of Washington. The book is dedicated to the late George Ellery Hale.

*Science News Letter*, September 17, 1938

## General Science

THE ADVANCEMENT OF SCIENCE, 1938—*British Assn. for the Advancement of Science, London*, 262 p., 3 s. 6 d. The annual volume containing the principal addresses delivered at the Cambridge B. A. A. S. meeting.

*Science News Letter*, September 17, 1938

## Psychology—Physiology

HEARING, ITS PSYCHOLOGY AND PHYSIOLOGY—S. Smith Stevens and Hallowell Davis—*Wiley*, 489 p., \$4.50. Authoritative, comprehensive, and technical is this textbook by the Harvard psychologist-physiologist team known for their sponsoring of the "place theory" to account for ability to distinguish between tones of different pitch.

*Science News Letter*, September 17, 1938

## Psychology

PETTING, WISE OR OTHERWISE?—Edwin Leavitt Clarke—*Association Press*, 32 p., 25 c. This Y. M. C. A. advice in fictional form points to the conclusion that the practice is not wise.

*Science News Letter*, September 17, 1938

## Entomology

INSECTS OF CITRUS AND OTHER SUBTROPICAL FRUITS—Henry J. Quayle—*Comstock*, 583 p., illus., \$5. Intended, of course, for a special group of workers, this book will be invaluable in its own field.

*Science News Letter*, September 17, 1938

## Anatomy

LABORATORY DIRECTIONS FOR COMPARATIVE VERTEBRATE ANATOMY—I. E. Gray—*Blakiston's*, 80 p., spiral binding, \$1.

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## Agriculture

YEARBOOK OF AGRICULTURE, 1938—U. S. Dept. of Agriculture—*Govt. Print. Off.*, 1207 p., \$1.75. See page 190.

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